

REMARKS

The Office Action dated November 19, 2004 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto. Claim 1 has been amended to correct a typographical error. No new matter has been added, and no new issues are raised which require further consideration or search. Claims 1-4 are currently pending in the application and are respectfully submitted for consideration.

In the Office Action, claims 1 and 4 were rejected under 35 U.S.C. §102(b) as being anticipated by Cam (U.S. Patent No. 5,875,192). The rejection is respectfully traversed for the reasons which follow.

Claim 1, upon which claims 2 and 3 are dependent, recites a system for detection of error conditions when passing a cell stream at a particular transmission rate from a first location to a second location over multiple links. The system includes a first unit at the first location coupled to one end of each of a plurality of low capacity data links for receiving the cell stream and inverse multiplexing the cell stream into frames that are transmitted over at least two data links trained to operate at optimal rates and selected from the plurality of low capacity data links that are set to active status. The system also includes a second unit at the second location coupled to the other end of each of the plurality of low capacity data links for receiving the frames from each of the active trained data links and multiplexing the frame to produce the cell stream, wherein the first unit inserts at least one detection cell containing a predetermined pattern that is known by

both the first unit and the second unit into each frame prior to transmission and the second unit analyzes the received detection cell to determine if an error condition exists.

Claim 4 recites a method for enhancing error detection in a data stream transmitted from a first unit to a second unit. The method includes establishing a desired cell size for a detection cell and a frequency of insertion into the data stream, determining a known signal that will be part of the detection cell, inserting the detection cell with the known signal into the data stream being transmitted from the first unit to the second unit, and analyzing the received detection cell at the second unit to determine if an error condition exists.

As will be discussed below, the cited prior art fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Cam discloses an ATM inverse multiplexing cell-based system for reducing error-multiplication due to error events in the transmitted cell stream. The system includes a first IMA assembly having an input coupled to an incoming cell stream from a first ATM layer device, a second IMA assembly having an output coupled to a second ATM layer device, and a plurality of links coupling the first IMA assembly to the second IMA assembly. The IMA device 11 multiplexes the incoming cell stream onto the plurality of links and inserts, onto the links, framing cells in the form of stuff “st” cells in place of idle cells and “S” cells to mark divisions in each channel corresponding to a given number of cells or a given time interval between successive “S” cells. “St” cells and “S”

cells are collectively referred to as framing cells. Each framing cell contains location information of both control and payload cells in a window of time into the past for each channel in the given link group, relative to the particular framing cell. The receiving IMA device 12 demultiplexes the cell streams by aligning the “S” cells and releasing the payload cells in such a way that the buffer is kept partially filled as much of the time as possible. When an errored cell is detected, the IMA device 12 will continue to buffer subsequent cell arrivals. Wherever a framing cell is received, the IMA device 12 examines the location information to determine which of the errored or missing cells correspond to payload cells.

Applicants respectfully submit that Cam fails to disclose or suggest a first unit that inserts at least one detection cell containing a predetermined pattern that is known by both the first unit and the second unit into each frame prior to transmission, as recited in claim 1. Similarly, Cam does not appear to disclose inserting the detection cell with the known signal into the data stream being transmitted from the first unit to the second unit, as recited in claim 4.

As discussed above, Cam only discloses that the receiving device demultiplexes and extracts location information from the framing cells (“st” and “S” cells) to identify errored or missing cells and to mark the location of those cells (Cam, Column 3, lines 5-20). Cam, however, does not disclose a detection cell containing a predetermined pattern as recited by the present claims. As recited in the claims and supported by the specification, the detection cells of the present invention contain a predetermined pattern

that is known at both ends of the link 28. As a result, an error can be detected much sooner because the detection cells are inserted frequently into each frame with known content (Specification, paragraph 0031). In addition, the detection cell may include sequencing information that can also be used to enhance error detection. Applicants respectfully assert that Cam does not disclose or suggest these limitations of the current claims.

In addition, claim 1 contains the limitation of at least two data links trained to operate at optimal rates. Cam fails to disclose or suggest that two or more data links are trained to operate at optimal rates. Therefore, Cam also fails to disclose or suggest this limitation of the claims.

For at least the reasons discussed above, Applicants respectfully submit that Cam fails to disclose or suggest all of the elements of claims 1 and 4. Thus, Applicants respectfully request that this rejection be withdrawn.

Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Cam in view of Sathe (U.S. Patent No. 5,617,417). The Office Action took the position that Cam discloses all of the elements of claim 2, with the exception of “at least one data link selected from the plurality of low capacity data links that is trained and set to idle status, wherein the first unit and the second unit switch to use the trained idle data link to replace any one of the active trained data links that has failed and wherein the status of the idle data link is changed to active, thereby avoiding system down time due to line failure.”

The Office Action then alleges that Sathe discloses this element of claim 2. The rejection is respectfully traversed for the following reasons.

Sathe discloses an asynchronous transfer mode inverse multiplexed communication system. A series of communication cells are multiplexed over each of a set of communication links. Each communication cell includes a framing bit such that the framing bits provide a predetermined framing bit stream for each communication link. On the receiving side, the inbound communication cells from each communication link are aligned according to the corresponding framing bit stream. The alignment provided by the framing bit streams enables compensation for the differing delays associated with each communication link. Each communication cell includes a control channel bit which provides a control message for each communication link. The control message specifies an ordered list of the logical identifiers indicating a multiplexed sequence of transfer of the communication cells over the communication links. Control messages are used to delete a failed communication link from the set of communication links and to restore the failed communication link after removal of the failure. The predetermined framing bit stream enables the determination of differential delays among multiple communication links. If the differential delays are excessive and beyond a maximum allowable limit, then the inverse multiplexed connection may be rejected.

Applicants note that claim 2 is dependent upon claim 1. As discussed above with respect to the rejection of claim 1, Cam fails to disclose or suggest all of the limitations of claim 1. Sathe also fails to cure these deficiencies in Cam. Furthermore, the combination

of Cam and Sathe fails to disclose or suggest all of the elements of claim 2. As such, claim 2 should be found allowable for at least its dependence upon claim 1, and for the specific limitations recited therein.

Claim 3 was rejected under 35 U.S.C. §103(a) as being unpatentable over Cam in view of Counterman (U.S. Patent No. 6,222,858). The Office Action also took the position that Cam discloses all of the elements of claim 3, with the exception of the trained data links operating at an optimal rate. The Office Action then relies upon Counterman to cure this deficiency in Cam. The rejection is respectfully traversed for the following reasons.

Counterman discloses a method for inverse multiplexing for ATM and for link grouping of communication links with different transmission rates and delay. The method supports links which use a portion of the link bandwidth for one QoS objective (low delay) and another portion for another QoS objective (low cell loss). The method involves searching each of a number of multiplexed flows with a predetermined number of cells. Cells are assigned to each flow during a number of cycles which make up an IMA frame. The number of cells assigned to each flow during each cycle is dynamically adjusted based upon the requirements of each flow. The number of cells assigned to each flow during each cycle may either be fixed or may vary from cycle to cycle.

Applicants note that claim 3 is dependent upon claim 1. As discussed above with respect to the rejection of claim 1, Cam fails to disclose or suggest all of the limitations of claim 1. Counterman also fails to cure these deficiencies in Cam. Furthermore, the

combination of Cam and Counterman fails to disclose or suggest all of the elements of claim 3. As such, claim 3 should be found allowable for at least its dependence upon claim 1, and for the specific limitations recited therein.

Applicants respectfully submit that Cam, Sathe, and Counterman, whether viewed alone or in combination, fail to disclose or suggest critical and important elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-4 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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